

Society Montreal, most of which were obtained in Canada. Two species of the genus *Euthamia*, *E. graminifolia*, the bushy goldenrod, and *E. Caroliniana*, a slender fragrant goldenrod, were added. A review of Dr. Whiteaves's paper on the 'Devonian System in Canada,' by Dr. H. M. Ami, and one on 'Dr. A. E. Barlow's report on the geology and natural resources of the Lake Nipissing and Lake Temiscaming district of Ontario and adjoining portions of Quebec,' by Dr. F. D. Adams are then given. These are followed by a review of Mr. Lambe's 'contributions' to Canadian paleontology, Vol. 4, Pt. 1, on paleozoic corals, by Dr. F. D. Adams, and a synopsis of the annual report of the Geological Survey of Canada, Vol. 10, by Dr. H. M. Ami. The volume concludes with the abstracts of meteorological observations taken at McGill College Observatory, Montreal, for the year 1899.

#### SOCIETIES AND ACADEMIES.

##### ZOOLOGICAL CLUB, UNIVERSITY OF CHICAGO.

##### MEETINGS OF THE SPRING QUARTER, 1900.

AT the first meeting of the quarter, April 11th, Professor C. B. Davenport read a paper entitled 'Variation in *Pectinella*' giving the results of a statistical study of the spines of the statoblasts. An abstract of this paper has appeared in an earlier number of SCIENCE. The session of April 25th was devoted to a paper by Dr. C. M. Child on 'Abnormalities in Cestodes.' The abnormalities described were selected from a number of specimens of the sheep tape-worm *Moniezia expansa*, most of them occurring in a single specimen in which over a hundred abnormal proglottids were found. The proglottids of this species are very short and wide with a set of genital organs and a pore on each side. The variations range from the simple incomplete separation of proglottids to long spiral proglottids, making seven turns about the body. In many cases very different form-relations occur upon the dorsal and ventral surfaces. The most interesting point in connection with the abnormal segments is the structure of their genital organs. All the organs show a very distinct correlation in form and structure with the form of the proglottid,

*i. e.*, a high degree of adaptation. In the incompletely separated segments, conditions are found ranging from the normal, with two complete sets of organs in each segment, through forms where the pores of two proglottids are approximated, or the ducts of two sets of organs are united and open through a common pore, to forms in which a proglottid of nearly double the normal length contains only one set of organs on each side, the different conditions being the result of differing degrees of union between the segments. So close is the correspondence between the form of the proglottid and the structure of the contained organs that, in cases where the form-relations are not alike on dorsal and ventral slides, the genital organs of the dorsal side (vas deferens, vagina and testes) correspond in position with the form-relations of the dorsal side, while the organs situated ventrally (ovary, vitellarium and seminal receptacle) conform to the relations on the ventral side.

In general each particular portion of the genital organs tends to occupy as nearly as possible its normal position with respect to the boundaries of the proglottid in its immediate vicinity. Abnormal form of the proglottid thus causes abnormal position and form in the genital organs, this being sometimes so great as to prevent the organs from being functional.

On May 9th, at the third session of the Club, Mr. E. R. Downing read a paper entitled 'The Spermatogenesis of *Hydra*,' giving the results of his study of this form.

The principal points of Mr. Downing's paper are as follows: The somatic cells divide amitotically usually, probably always. The spermatogonia arise by amitotic division from the interstitial cells and from the ectoderm cells. They divide mitotically to form the spermatocytes of which there is a single generation. These form the spermatids by mitosis. Preceding each mitotic division the nucleus and cell both increase in size, especially the former. After division the daughter cells become correspondingly smaller. The spermatocytes and spermatids contain six chromosomes, the spermatogonia twelve. In the prophase of mitosis the nuclear reticulum becomes more coarsely meshed, and the chromatin gathers into a num-

ber of karyosomes, which later become chromomeres. There are twenty four of these in the spermatocytes and forty-eight in the spermatogonia. The spireme consists of a single linin thread connecting these chromomeres and forming a spiral which winds about the nucleus just beneath the nuclear membrane. At this stage the nucleus is an ellipsoid of revolution. The spireme makes three complete whorls about the spermatocyte nucleus; but six such whorls are formed in the nucleus of the spermatogonium. The centrosome appears at one side of the nucleus in the plane of its minor axis. The nucleus changes next to an oblate spheroid with the centrosome over the pole. The arcs of the spiremes form meridians. There are, therefore, six such meridians in the spermatocytes and twelve in the spermatogonia. Each has four chromomeres. The spireme now divides at the poles into six and twelve segments respectively. These contract, forming spherical chromosomes at the equator. In the chromosomes the individual chromomeres are indistinguishable. Twenty-four karyosomes are to be made out in the late metaphase of the spermatogonic divisions.

The spermatid nucleus assumes the ellipsoid shape. The cytoplasm immediately about it changes so that it will not stain and a small drop of non-staining material forms at one end of the nucleus. This grows in size as the cytoplasm appears to be altered by the nucleus, absorbed by it and stored. This droplet increases until the nuclear wall which covers it, touches and fuses with the cell wall. A slight projection appears at this point of fusion. It rapidly elongates to make the tail. The droplet which forms the middle piece decreases correspondingly. Meantime the cytoplasm and cell wall have completely disappeared. The centrosome appears within the middle piece. From it anteriorly and posteriorly runs the axial fibre. Within the head of the sperm six dumbbell-shaped bodies are apparent, the persistent chromosomes.

The next meeting was held on May 29th and was devoted to two papers. The first of these 'Variation in *Daphnia hyalina*' was read by Miss M. M. Enteman. The following is a brief abstract:

The shell of *D. hyalina* is extremely variable. For the head crest a range of variation is observed covering forms characteristic for many different species of the genus *Daphnia*. The principal forms described for Europe are a low-rounded and a high-rounded crest, and a crest terminating in a more or less acuminate apex. In America, the species, as far as studied, shows the same variations, and, in addition, a triangular and an extremely recurved crest. Further it is to be noted, that while the European varieties resemble other European species in the form of the shell, the American varieties resemble the American representatives of these species. A study of local variation shows widely differing conditions for related regions, some lakes possessing a single stable form, while others furnish all transitions between extreme varieties. Finally, however, different the summer varieties, they are all represented by a uniformly low-crested form in the winter. The species abounds in our clear northern lakes, and these considerations ought to make it a favorable subject for the determination of environmental influences.

The second paper of the session was a review by Mr. R. H. Johnson of the paper 'On the Reactions of *Daphnia magna* Strauss to Certain Changes in its Environment' by E. Warren (*Quart. Journ. Micr. Sci.*, Vol. XLIII., Pt. 2, 1900).

C. M. CHILD.

#### THE BOTANICAL CLUB OF CANADA.

THE Botanical Club of Canada was organized by a committee of section four of the Royal Society of Canada, at its meeting in Montreal, May 29, 1891. The object is to promote by concerted local efforts and otherwise the exploration of the flora of every portion of British America, to publish complete lists of the same in local papers as the work goes on, to have these lists collected and carefully examined in order to arrive at a correct knowledge of the precise character of our flora and its geographical distribution, and to carry on systematically seasonal observations on botanical phenomena. The intention is to stimulate with the least possible paraphernalia of constitution or rules, increased activity among botan-



ists in each locality, to create a corps of collecting botanists wherever there may be few or none at present, to encourage the formation of field clubs, to publish lists of local floras in the local press, to conduct from year to year exact phenological observations, etc.; for which purposes the secretaries for the provinces may appoint secretaries for counties or districts, who will be expected, in like manner, to transmit the same impetus to as many as possible in their own spheres of action. Members and secretaries, while carrying out plans of operation which they may find to be promising of success in their particular district, will report as frequently as convenient to the officer under whom they may be immediately acting. Before the end of January, at the latest, reports of the work done within the various provinces during the year ended December the 31st, previous, should be made by the secretaries for the provinces to the general secretary, from which the annual report to the Royal Society shall be principally compiled. By the first of January, therefore, the annual reports of county secretaries and members should be sent in to the secretaries for the provinces.

The annual report of the club for the year May 20, 1898, to May 20, 1899, issued as a part of Vol. V., *Trans. Roy. Soc. Can.*, second series, 1899-1900, contains a sketch of the history of 'Phenological Observations in Canada.' It also indicates the progress of botanical research, points out the results obtained in Newfoundland, as well as in Labrador, Prince Edward Island and Nova Scotia. This is followed by 'Observations in a Wild Garden,' by Dr. G. U. Hay, of St. John, New Brunswick, besides notes on work done in Ontario. Professor Macoun's researches in the 'Cryptogamic Flora of Ottawa,' published in *The Ottawa Naturalist*, and Mr. James M. Macoun's 'Contributions from the Herbarium of the Geological Survey of Canada' have been published in *The Canadian Record of Science* and in *The Ottawa Naturalist*.

Full descriptions of the new species of Ottawa Violets were given with excellent plates in *The Ottawa Naturalist* of January, 1899, No. 10, Vol. XII., and reference is also made to *Viola Watsoni* Greene, from Prince Edward Island, and another new species from British Columbia,

besides notes on the genera *Antennaria* and *Fragaria*.

From Alberta, Assiniboia and British Columbia reports are also sent in. The teachers of the Department of Public Instruction in Nova Scotia, of which Dr. A. H. MacKay is Superintendent, have been most active in recording phenological observations, from which excellent results were gathered.

The officers of the Botanical Club of Canada for the ensuing year are:

*President*: John Macoun, M.A., F.L.S., Ottawa.

*General Secretary-Treasurer*: A. H. MacKay, LL.D., Halifax.

*Secretaries for the Several Provinces*: Newfoundland, Rev. A. C. Waghorne, Bay of Islands.

Prince Edward Island, Principal John McSwain, Charlottetown.

Nova Scotia, Dr. A. H. MacKay (General Secretary-Treasurer), Halifax.

New Brunswick, George U. Hay, M.A., Ph.B., St. John.

Quebec, Professor D. P. Penhallow, B.Sc., McGill University, Montreal.

Ontario, Principal Wm. Scott, B.A., Normal School, Toronto, Toronto.

Manitoba, Rev. W. A. Burman, B.D., Winnipeg.

Assiniboia, Thomas R. Donnelly, Esq., Pheasant Forks.

Alberta, T. C. Willing, Esq., Olds, N. W. T.

Saskatchewan, Rev. C. W. Bryden, Willoughby.

British Columbia (Mainland), J. K. Henry, B.A., High School, Vancouver.

Vancouver Island, A. J. Pineo, B.A., High School, Victoria.

H. M. A.

OTTAWA, June, 1900.

#### DISCUSSION AND CORRESPONDENCE.

##### HERMAPHRODITISM AMONG THE DOCOGLOSSA.

IN a recent number of *SCIENCE* (ix, 914) Dr. Dall gives a brief account of the newly discovered *Bathysciadium conicum*, in the course of which he remarks that should the animal prove to be really hermaphrodite, it will be the first of the Docoglossa to exhibit this character. This statement is one of Dr. Dall's rare slips; hermaphroditism has already been recorded in the case of *Patella vulgata* (Gemmill, *Anat. Anz.*, xii, 392-4, 1896), and of *Acmæa fragilis* (Willcox, *Jen. Zeitschr.*, xxxii, 441 et seq., 1899). Gemmill believes that this condition in *Patella* is excep-

tional; in *A. fragilis* it seems to be the normal condition. My reason for this opinion is that the nephridial papilla, which appears to function as a penis, is present in all individuals. This papilla is much larger in *A. fragilis* than in any other *Acmæa* with which I am acquainted, reaching even in the contracted state almost to the edge of the mantle; it is highly muscular and richly provided with large blood sinuses. These facts point to its use as an intromittent organ and if this be conceded, then its universal presence would indicate that every individual is at some time functionally a male.

But however this may be, hermaphroditism either as a regular or as an exceptional condition has already been described in two *Docoglossa* so that the case of *Bathysciadium* is the third rather than the first recorded instance.

M. A. WILLCOX.

WOOD'S HOLL, MASS., July 25, 1900.

#### SOME RECENT REPORTS OF FOREIGN MUSEUMS.

THE report of the South African Museum for 1899 notes the completion of a new wing and the opening of a new hall containing a collection of South African rocks, minerals and fossils, while the number of visitors was over 88,000, a gain of 7000 over the previous year. As the appropriation for the Museum is only £2500 the increase of the collections is mainly dependent on gifts, and although a special appropriation of £2000 for the purchase of specimens was made in 1895 this is now exhausted. The progress made is as rapid as could be hoped for under the circumstances, but one can well sympathize with the remark of Mr. Peringuey, in charge of the entomological collections, that the chance of obtaining a thorough representation of the insect fauna of South Africa during the modest span of life usually allotted to man, seems to grow more and more distant.

The Museum has just issued the first part of the second volume of its *Annals* which is devoted to 'A Collection of Slugs from South Africa, with Descriptions of New Species' by Walter E. Collinge. Two well-known species are added to the fauna of South Africa while four species are described as new; *Amalia pon-*

*senbyi*, *Apera natalensis*, *Oopelta flavescens* and *O. granulosa*.

THE report of the Museum of Oxford University for 1899 indicates much progress in educational work and scientific research, as well as in the growth and arrangement of the collections. Three new buildings are in course of construction, the Laboratory of Animal Morphology and Botany, the Pathological Laboratory and the Radcliffe Library. Accessions to the well-known Pitt-Rivers Museum of Ethnology have been the most numerous, although exceeded in number of individual specimens by the insects added to the Hope Collection in charge of Professor Poulton. Our own scientific schools may derive some comfort from the small number of students who seem to have attended many of the courses of lectures, and when Professor Tylor reports a class varying from four to six undergraduates others have little reason to expect more.

PART one of volume three of the *Boletim do Museu Paraense* contains the report of the Director for the fiscal year ending December 31, 1898, together with other papers. The Zoological and Botanical Gardens of Para are included in this report and these, as well as the Museum proper, seem to be in a flourishing condition, while as the visitors during the year numbered somewhat over 75,000, the Museum would seem to be appreciated by the public. The average number of animals in the Garden has been something over 400, representing 130 species, and the Botanic Garden gives a list of 531 species of plants. Attention is called to the fact that the Museum publications represent but a portion of the work of the staff as numerous articles are published in foreign scientific journals.

THE Para Museum has just issued as the first of its memoirs, in quarto form, an account by the Director, Dr. Goeldi, of the exploration of the mortuary vaults constructed by a former race of Indians on the banks of the Rio Cunany, and of the pottery found therein. These vaults or pits were about seven feet deep and half that in diameter, closed above by a granite disk, and at the bottom expanding into a somewhat hemispherical chamber in which the



pottery was found. This consisted of a number of vases and flattened dishes of quaint and graceful shapes decorated with elaborate patterns in red. These are admirably depicted in the plates accompanying the memoir and indicate a very degree of art in the part of their designers.

F. A. L.

#### RECENT PROGRESS IN THE EXAMINATION OF FOODS AND DRUGS.

##### NEW PLANTS AND DRUGS.

THEODORE PECKOLT has been continuing his work upon the medicinal and economical plants of Brazil (see *Berichte d. deutsch Pharm. Ges.*). Duyk likewise continues his communications upon Mexican drugs (*Bull. Soc. Pharm. Brux.*, XLIII., and *Bull. Comm.*, XXVIII.). In the consideration of the useful plants of Mexico, J. N. Rose (contribution, U. S. Nat. Herbarium, V., No. IV) treats of the plants of Mexico which are employed for making beverages, seasoning, flavoring, soap, tanning, dyeing as well as those of a strictly medicinal application. J. S. Ward has described some new West African plants in *Pharm. Jour.*, 1900. Several Indian plants have been examined by S. Camphuijo (see *Nederl. Tijdschr. v. Pharm.*, 1899). The arrow poisons of Wagogos are obtained, according to Schellman, by boiling the bark of two trees of the N. O. Euphorbiaceae. *Pilocarpus racemosus*, of the French Antilles, is given by Rocher as a new source of Jaborandi. The leaves contain 0.6 per cent. of pilocarpine and 0.4 per cent. of jaborine. David Hooper has shown that the ancient eastern medicine, *Akakia*, is an astringent extract of an acacia. Schumann has added to our knowledge of the kola exported between Senegal and Angola. All kola seeds are wrapped with the leaves of *Cola cordifolia*. The large seed (nguru) is obtained from *Cola vera*; whereas the small seed (kotofo) is the product of *C. acuminata*. The natives of Bali also employ the seeds of *C. lepidota* and *C. anomala*. According to the investigations of Hendrickx and Coremans, the leaves of *Theobroma kalagua* may be employed as substitutes for kola and cacao.

H. Moeller does not consider that *Rheum Franzenbachii* furnishes any of the commercial rhubarb. Ergot from rice, cultivated by the

Indians in Northern Wisconsin, has been examined by R. H. Denniston. Heckel and Schlagdenhauffen find quassin and saponin in the seeds of *Brucea Sumatrana* (N. O. Simarubaceae). These seeds known as kosam seeds are used in China and India for dysentery. Bertrand and Physalix believe the activity to be due to a glucoside which they call kosamin. A new rubber plant of Lagos (*Fantumnia elastica*) is described by Staff. *F. africana* (syn. *Kicksia africana*) does not appear to yield any rubber.

*Cathaedulis* contains according to Schaer large quantities of caoutchouc, an ethereal oil, alkaloid and tannin. Large edible tubers, called 'native yams' are yielded by *Parsonia paddisoni* (N. O. Apocynaceae). Piralahy rubber (Madagascar) is the product of *Landolphia perrieri* H. Jumell. Altamassano has extracted from Coniza, one of the Mexican compositae, a glucoside which he calls lennesine. Several species of Polygala (*P. violacea* St. Hil. and *P. caroeasana* H. B. K.), have been found by Dethan in commercial ipecacuanha. Small jaborandi leaves have been utilized as an adulterant in coca. A new spurious senna has been described by Greenish while Micko has discovered another false cinnamon bark. This is yielded by an unknown species of *Cinnamomum*, but does not contain the aromatic cinnamon oil.

##### PLANT CONSTITUENTS.

The investigations of Hesse on the Solanaceous alkaloids show that the active principles of *Hyoscyamus* are chiefly hyoscyamin with some atropin and hyoscin; while *Belladonna* root contains an excess of atropine; and *Scopola* rhizome contains chiefly hyoscin with some atosin. The two last mentioned bases are found in the scopolamin of commerce.

Hesse finds as a result of an investigation of the various commercial rhubarbs that the Chinese rhubarb contains chrysophanic acid, emodin, rhabarberon and rhein; Austrian rhubarb (*Rheum rhaponticum*) and English rhubarb (*R. palmatum*) contain chrysophanic acid and rhapontin; *Rumex nepalensis* and *R. palustris* contain chrysophanic acid and nepodin; *Rumex obtusifolia* contains chrysophanic acid, nepodin and lopodin.

Tschirsch holds that the emodin of aloes and frangula are isomeric and that they can be distinguished by certain color reactions as well as by other tests as shown by the investigations of Oesterle. Tschirsch further holds that all methylantraquinone derivatives, containing one or more oxy-groups, are purgative. The emodins, being tri-oxy-compounds, seem to be the most active. It is suggested that these oxy-derivatives of methylantraquinone will eventually replace the drugs as aloes, rhuarb, etc., which contain them.

According to H. A. D. Jowett the following alkaloids are present in Jaborandi: pilocarpine, iso-pilocarpine (pilocarpidine of Petit and Polonowski), pilocarpidine (Harnack and Merck). Jaborine does not appear to be present in jaborine leaves and the commercial jaborine is said to be a mixture of these three alkaloids. The alkaloid in Mandragora root is, according to Wentzel, hyoscine ( $C_{17}H_{19}NO_3$ ). In an investigation of the constituents of the wall-flower of the gardens, Reeb has isolated a principle (cheiranthin) resembling digitalis in its physiological action and has found in the seeds an alkaloid (cheirinine) which resembles quinine in its properties. The active principle in Capsicum has been further investigated by Micko, who insists that it is odorless and that the vanilla-like odor ascribed to it by Mörbitz is due to the action of reagents employed. An emetic principle has been isolated by Herberger from melon root and other Cucurbitaceae. The toxic effects of tobacco is ascribed by Thoms to a phenol-like body resembling creosote. A new oily alkaloid ( $C_9H_{18}NO$ ), which is miscible with water, has been isolated by A. Piccinni from pomegranate bark. The daturine in the seeds of *Datura stramonium* L. is considered by J. Thomann to be in the nature of a reserve product. The flowers of *Datura alba* contain hyoscine which Hesse says may supersede the mixture known as scopolamine salt. Investigations seem to show that there is no caffeine in the leaves of any species of Psathura (N. O. Rubiaceae).

Pommerhue has succeeded in making a number of crystalline compounds of the alkaloid, damascenin, extracted by Schneider from *Nigella damascena*. It has been found by H.

Meyer that anemonin forms compounds of the maleic and fumaric types. According to Hausman, aspidin is found in *Aspidium spinulosum*, whereas filicic acid is present in *Aspidium filix-mas* and *Athyrium filix femina*. A crystalline non-glucosidal principle (gossypol) obtained from cotton seeds has been examined by Marchlewski. The bitter principle of *Plumiera lancifolia*, investigated by Boorsma and Merck with discordant results, is shown by Franchimont to vary in its M. P., according to the amount of water of crystallization that it possesses. According to Léger, nataloin and homonataloin give a green coloration with sulphuric acid and manganese dioxide or potassium di-chromate; and a violet color with a solution of soda containing ammonium persulphate. The investigations of Busse seem to indicate that in the unripe vanilla fruit there exists a glucoside, which on treatment with ferments (emulsin) or mineral acids, yields vanillin. The arrow poison of Wakamba (German East Africa) appears to be a glucoside and resembles Arnaud's ouabain. According to the investigations of Hilger, while the coloring principle of saffron is a glucoside, the glucoside, picrocrocin (or saffron bitter) is really a mixture of coloring principles, one of which resembles carotin. Malabar kino has been shown by David Hooper to possess in dry substance over 90 per cent. of tannin. *Hymeneo coubaril* contains 23.8 per cent. catechutannic acid and 2.7 per cent. of catechin. A. G. Perkin has been continuing his studies on the tannin and allied coloring principles of a number of plants. A yellow coloring principle has been isolated by Adrian and Trillat from the digitalin obtained from *Digitalis lutea*. The authors believe it to be different from the digito-flavone of Fleischer. The green and red pigments of *Amanita muscaria* have been subjected to a chemical examination by A. B. Griffiths. A. Nestler believes that the change in color in the ripening of Juniper berries is due to a fungus. The investigations of Charabot on the formation of lavender oil seems to indicate that the oil contained in the flower buds and mature flowers is richer in esters; whereas in the withered flowers it is the alcohols which preponderate. According to G. Spampani, the oil in olive is produced in the



cells of the mesocarp in particular, during the activity of the protoplasm and not on account of the degeneration of the latter. The malic acid in the berries of *Hippophæ rhamnoides* is identical with the acid in *Pyrus aucuparia*. Greshoff has investigated the Pisang wax, the product of an unknown plant of Lower India. The carbohydrates of Tragacanth have been re-investigated by Widstoc and Tollens. Xylose was obtained from the white and arabinose from the brown varieties respectively. Dulcite and not mannite has been found by Hoehnel in *Euonymus atropurpureus*. The same carbohydrate is present in *E. Europæus*.

According to the investigations of J. Grüss, the enzyme in *Penicillium glaucum* acts less powerfully on starch or reserve cellulose, but more energetically on cane sugar, than malt diastase. Semnase, the ferment in leguminous seeds possessing a horny albumin, differs from malt diastase in that its action is less active on starch, but more active on the albumin of the locust bean than diastase. An enzyme (hadromase) has been found by Marshall Ward in the fungi (*Pleurotus pulmonarius* and *Merulius lachrymans*) which destroys the lignified cells of timbers.

HENRY KRAEMER.

PHILADELPHIA COLLEGE OF PHARMACY.

#### THE PRESIDENT'S ADDRESS BEFORE THE SOCIETY OF CHEMICAL INDUSTRY.

THE annual general meeting of the Society of Chemical Industry took place on July 18th in the lecture theater of the Royal Institution, London. After the transaction of some formal business, including the presentation of the council's report, which showed that the society has now 3459 members, the president, Professor C. F. Chandler, of Columbia University, delivered his address. According to the abstract in the *London Times* he said that on looking over the addresses of past presidents he found that almost every chemical topic—theoretical, practical and historical—had already been dealt with, and his only hope of being able to say anything that was not already thoroughly familiar rested in the presentation of matters purely American. Treating, first, of chemical and technical education in the United

States, he described its beginnings and development, paying special attention to the Columbia School of Mines, afterwards merged in the Columbia University. He ascribed the prompt success of this school to the fact that a fixed and definite progressive course of study was offered for each profession, from which no deviation was allowed. The faculty decided what subjects were necessary for a student to pursue in order to qualify him for his profession, and did not permit him to select the studies which he happened to find most interesting. While Columbia was developing her system of professional education in the applied sciences many other institutions were doing the same. The most striking feature of the American system of higher and technical education was to be found in the fact that most of the institutions had been founded and maintained by liberal gifts of money from wealthy citizens, in many cases made during the donor's lifetime, and that only a small number had been endowed or supported by the public funds. Thus in 1899 over 33 million dollars were given in this way, the largest sum being the 15 million dollars given by Mrs. Leland Stanford, together with large tracts of land, to which as yet no precise value could be attached, to complete the endowment of the Leland Stanford Junior University. There were in all 174 donors, averaging \$190,000 each.

Schools of chemistry were now so numerous in the United States that it was almost impossible to state their exact number, but he was safe in saying it was more than 100. In all there were 480 universities and colleges, and 43 technical schools not included in this list. In 1899 it was stated that there were 9784 students pursuing professional courses in the schools of engineering, while 1487 graduated that year, receiving the degree of civil, mechanical, electrical or mining engineer. No one could estimate the value to the industrial development of the United States of such an army of thoroughly trained engineers and chemists. Professor Chandler next referred to what had been done by the chemical societies in benefiting and consolidating the profession in America, and went on to speak about the original investigation carried on by American chemists. He said he

could present a long list of valuable contributions to chemical science from American laboratories but it was a regrettable fact that many of their teaching chemists were so overburdened with the duties of instruction and the business of managing large laboratories that they could find but little time for original work.

The president next gave an account of the many important investigations in agricultural chemistry which had been conducted by the chemical division of the United States Agricultural Department, among those mentioned being the practical determination of the number and activity of the nitrifying organisms in soil, the influence of a soil rich in nitrogen on the nitrogen content of a crop, the manufacture of sugar from the sorghum plant, and the comparative study of typical soils of the United States. Of agricultural experiment stations there were now 59, and the 148 chemists connected with them had done a large amount of original investigation in subjects more or less closely allied to agricultural and physiological chemistry. One of the most important purposes of these stations was the protection of the farmer from the cupidity of the dealers in artificial manures, every fertilizer sold being now subjected to careful analysis, of which the results were published from time to time. Many other researches in this branch of chemistry were enumerated in the address, which went on to refer to the work of the United States Geological Survey and to the progress of sanitary chemistry in America. Professor Chandler next gave a long and comprehensive account of the chemical industries of the United States. Beginning with a statement of the raw materials produced by the country, he passed on to speak of the various ways in which they were utilized, and gave an immense amount of information respecting the manufacturing processes in use.

In particular he referred to the progress made in electro-chemistry, and described the methods now adopted for the reduction of aluminium at Niagara and also for the manufacture of carborundum and artificial graphite. Speaking of water gas he described the opposition which had been brought to bear against its

introduction for illuminating purposes. The question came before the Health Department of New York, of which he was at the time president, and after careful investigation the department decided that the gas was such an improvement in quality and price while the increased danger as compared with that from old-fashioned coal gas was so slight, that it was not wise to interfere with it. The water gas industry had now taken almost complete possession of the whole country. It seemed safe to say that there were at least 500 gas companies using water gas wholly or in part, and it was estimated that in 1899 three-quarters of the entire consumption, or 52,500 million cubic feet, consisted of carburetted water gas. The price of this was reduced ultimately to \$1 per 1000 cubic feet, the average quality being between 26 and 27 candle power, as against bituminous coal gas at \$3.75 per 1000, with an illuminating power of 16 or 17 candles.

#### THE JESUP NORTH PACIFIC EXPEDITION.\*

MESSRS. WALDEMAR JOCHELSON AND WALDEMAR BOGORAS, of the *Jesup North Pacific Expedition* of the American Museum, have recently started for the northeastern part of Asia, by way of San Francisco and Vladivostok, to continue the work of the Expedition in Siberia.

The region which Messrs. Jochelson and Bogoras are about to visit is situated northeast of the Amoor River. They will study the relations of the native tribes of that area to the inhabitants of the extreme northwestern part of America, and also to the Asiatic races visited by Dr. Laufer, under the auspices of the Museum, and to those living farther west. It is expected that in this manner they will succeed in clearing up much of the racial history of these peoples, and it is hoped that the question as to the relations between the aborigines of America and Asia will be definitely settled. Thus the work of these explorers is part of the general plan of the *Jesup North Pacific Expedition*, which was organized for the investigation of the relations between the tribes of Asia and America. It is fortunate that this inquiry has been taken up at the present time, since the gold discoveries along the coast of

\* From the *American Museum Journal*.



Bering Sea are rapidly changing the conditions of native life; so that within a few years their primitive customs, and perhaps the tribes themselves, will be extinct.

The expedition, after leaving Vladivostok, will go by sea to the northeastern part of the Sea of Okhotsk, where they will establish their winter quarters. Mr. Jochelson expects to spend the winter among the tribes of this coast, part of whom belong to the great Tungus family which inhabits the greater part of Siberia, while others belong to a little-known group of tribes inhabiting the extreme northeastern portion of Asia. Mr. Bogoras will make a long journey by dog-sledge across that part of the country which is north of the peninsula of Kamtchatka, and will spend much of his time among the Chukchee, whose mode of life is quite similar to that of the Eskimo of the Arctic coast of America. Mr. Bogoras is exceptionally well prepared for this work, since he has spent several years among the western Chukchee, who are a nomadic tribe, and subsist on the products of their large herds of reindeer. There is also a small tribe of Eskimo living on the Siberian coast, whom Mr. Bogoras expects to visit.

Mr. Jochelson, after finishing his work on the coast of the Okhotsk Sea, will proceed northwestward, crossing the high mountains which stretch along the coast, on a trail never before visited by white men. Over this route he expects to reach the territory of another isolated tribe, the Yukagheer. On a former expedition Mr. Jochelson visited a western branch of this tribe, whom he reached starting from Irkutsk, in southern Siberia. Owing to the difficulties of the passage, Mr. Jochelson will not return to the coast of the Okhotsk Sea, but will continue his journey westward through Asia, and reach New York by way of Moscow and St. Petersburg.

Both Mr. Jochelson and Mr. Bogoras have carried on a series of most remarkable investigations in Siberia, which are at present being published by the Imperial Academy of Sciences in St. Petersburg. The results of their previous investigations embrace a mass of information on the customs, languages, and folk-tales of the tribes whom they visited.

It may be expected that their journey, which will extend over a period of two years, will result in a series of most interesting additions to the collections of the Museum, and in an important advancement of our knowledge of the peoples of the world.

#### SCIENTIFIC NOTES AND NEWS.

A MOVEMENT has begun in London to arrange for the erection of a memorial in honor of the late Sir William Flower.

THE Royal Society of Surgeons of England has elected, in connection with the celebration of its centenary, a number of honorary fellows, subject to their attendance at the celebration. These include Dr. I. H. Cameron, Toronto University; Dr. William S. Halsted, Johns Hopkins University; Sir W. H. Hingston, Laval University; Dr. W. W. Keen, Jefferson Medical College; Dr. T. G. Roddick, McGill University; Dr. J. C. Warren, Harvard University, and Dr. R. F. Weir, Columbia University.

PROFESSOR CAMILLO GOLGI, eminent for his researches on the nervous system, has been made a senator of the kingdom of Italy.

PROFESSOR RUDOLF LIPCHITZ, professor of mathematics in the University at Bonn, has been elected a correspondent of the Paris Academy for the section of geometry.

SIR JOHN EVANS has been elected chairman of the Society of Arts, London.

MR. GRANT-OGILVIE, principal of the Heriot-Watt College, has been appointed director of the Museum of Science and Art, Edinburgh.

LORD KELVIN has been elected Master of the Worshipful Company of Clothworkers for the year 1900-1901.

THE steamship *Queen* which arrived at Victoria on August 4th from Alaska had among its passengers W. F. King, the British Alaskan Boundary Commissioner; O. H. Tittman, the American member of the Commission, and O. B. French, assistant. They have concluded their work on White, Chilkoot and Chilkat passes.

DR. W. J. HOLLAND, of the Carnegie Museum, sailed for Europe on August 7th. He will be absent for four weeks.

MR. S. WARD LOPER, curator of the museum of Wesleyan University, has gone to Cape Briton Island under the auspices of the U. S. Geological Survey to study the pre-Cambrian geological formation discovered by Dr. F. S. Mathew.

DR. GEORGE A. DORSEY, curator of anthropology in the Field Columbian Museum, has returned from explorations in the southwest and has gone to Paris as a delegate to the International Congress of Anthropology.

DR. L. E. GRIFFIN, Bruce fellow at the Johns Hopkins University, is at present in Jamaica carrying on researches in animal morphology.

A LETTER has been received in Moscow from Dr. Swen Hedin narrating an excursion into Thibet. He reached Lake Lob Nor on the shores of which he discovered extensive ruins.

THE Madras Government has given an additional grant of 800 rupees to Captain R. H. Elliott for the continuation of his researches on snake venom.

DR. S. A. KNOPF of New York City, has received the prize of 4000 Marks offered by the Tuberculosis Congress at Berlin for the best essay on the subject 'How to Fight Tuberculosis as a Disease of the Masses.'

DR. T. G. BRODIE has been awarded twenty-five guineas from the Goldsmiths' Research Grant of the Royal College of Physicians in recognition of his work on the separation of diphtheria antitoxins.

THE Society of Chemical Industry has awarded its medal to Dr. Edward Schunck for his investigations on natural coloring matters and other researches in technical chemistry.

DR. RUDOLF of Strasburg, has received the Engelmann award (2500 Marks) of the University for geographical exploration.

A BOARD of Medical Officers has been appointed to meet at Camp Columbia, Quemados, Cuba, for the purpose of pursuing scientific investigations with reference to the infectious diseases prevalent on the Island of Cuba. The Board will act under instructions from the Surgeon-General of the Army. The members of the Board are Major Walter Reid, Surgeon U. S. A., and Acting Assistant Surgeons, James

Carroll, Aristides Agramonte, and Jesse W. Lazear. It is understood that the Board will devote attention chiefly to the investigation of yellow fever.

THE Berlin Academy of Science has made the following grants: Professor Adolf Schmidt, of Gotha, for the collating and publication of material on terrestrial magnetism, 750 Marks; Dr. Leonhard Schultze, of Jena, for investigations on the heart of invertebrates, 2000 Marks; Professor Emil Ballowitz, of Greifswald, for investigations on the structure of the organs of smell of vertebrates, 800 Marks; Dr. Theodore Boveri, of Würzburg, for experiments in cytology, 500 Marks; Professor Maxime Braun, of Königsberg, for studies on the Trematodea, 970 Marks; Dr. Paul Kuckuck, of Heligoland, for investigations on the development of Phaeosporeæ, 400 Marks; Dr. Wilhelm Solomon, of Heidelberg for his geological and mineralogical investigations in the Adamello mountains, 1000 Marks; Professor Alexander Tornquist, of Strasburg, for the publication of his work on the mountains of Vicenza, 1100 Marks; Professor Alfred Voltzkow, of Strasburg, for the drawings of his work on the development of the crocodile, 1000 Marks; Professor Johannes Walther, of Jena, for the publication of his work on deserts, 1000 Marks.

WE regret to note that Dr. Gustav Born, professor of anatomy at the University at Breslau, died on July 6th, aged 49 years, and that Dr. Wiltheiss, associate professor of mathematics at Halle, died on July 9th.

THE contest of the will of the late Dr. Thomas W. Evans has been compromised by the payment of \$800,000 to the heirs. This, it is said, will leave about \$3,000,000 for the dental college and museum to be established at Philadelphia.

SURGEON-GENERAL STERNBERG states that 100 additional medical officers are wanted by the government for duty in the Philippines and in China.

THE schooner *Grampus*, of the U. S. Fish Commission, which returned on August 1st from a trip to the tile fishing grounds, reports a greater abundance of tile fish than ever before.

THE British Medical Association held its 68th



annual meeting at Ipswich from the 31st of July to the 3d of August, under the presidency of Dr. John Ward Cousins. According to the announcement of the program the general addresses were as follows: Address in Medicine, by Philip Henry Pye-Smith, M.D., F.R.S., consulting physician, Guy's Hospital; Address in Surgery, by Frederick Treves, surgeon extraordinary to H.M. the Queen; Address in Obstetrics, by William J. Smyly, examiner in midwifery, Royal College of Physicians, Ireland. The Association met in thirteen sections, including one on navy, army and ambulance, established this year for the first time. This section and the one on tropical diseases have especially full programs.

THE Swiss Scientific Society holds its 83d annual meeting at Thusis on the 2d, 3d and 4th of September. With it meet the Geological, Botanical and Zoological Societies of Switzerland. A number of interesting excursions have been arranged in connection with the meeting to which foreign men of science are invited.

THE International Society of the Psychical Institute is the name of a society recently established in Paris for the purpose of obtaining money to establish a museum and library at Paris, to encourage research, to publish a journal, etc. The society wishes to cover the whole field of psychology, but will apparently especially concern itself with those more or less occult phenomena in which societies for psychical research have chiefly interested themselves. The American members of the committee endorsing the program are Professor J. Mark Baldwin, Professor J. Howard Gore and Mr. Elmer Gates.

MR. J. E. S. MOORE, of the Royal College of Science, London, has returned from Central Africa, where he has been engaged in explorations under the auspices of the Royal Geographical Society. Among the results of his expedition are the ascent of one of the Mountains of the Moon, about 16,500 feet high; the more exact location of Lake Tanganyika, which is said to be fifty miles west of its ascribed position, and the discovery that Kivu is a much larger lake than had been supposed.

THE construction of the vessel designed by

Mr. W. E. Smith, one of the chief constructors to the Admiralty, for the National Antarctic Expedition is, as we have already noted, in active progress at the yard of the Dundee Shipbuilders' Company. The *Times* states that the ship, which is to be named the *Discovery*, is to be barque-rigged and to have three decks. Accommodation for those on board will be provided under the upper deck. The stem will be of the ice-breaker type, with strong fortifications. The length of the vessel between perpendiculars is 172 feet; beam, 34 feet; and depth, 19 feet. The timbers are of oak, dowelled and bolted together, and the keel, deadwoods, the stem, and the stem-posts are also of oak. The planking is of American elm and pitch pine, and the inside beams are of oak. With the object of avoiding the magnetic influence of iron on the scientific instruments on board, it has been decided that for a considerable radius amidships the knees and fastenings shall be of naval brass. In case the *Discovery* should have to winter in the ice, a heavy wagon cloth awning of strong woollen felt is to be provided. The fittings and equipment of the vessel will be of the most modern type. The engines, which are to indicate 450-horse power, are to be constructed by Messrs. Gourlay Brothers and Co., Dundee.

WE learn from the London *Times* that another addition to the numerous existing processes designed to prevent decay in wood is now being introduced into England by the Xylosote Company in the shape of the Hasselmann system. In this the timber to be treated is enclosed in a cylindrical vessel in which a fairly high vacuum can be produced by a suitable air-pump. When the sap has been drawn out of the pores under the diminished pressure a solution of metallic and mineral salts is allowed to flow into the vessel, and the wood is steeped in this for some hours under a certain pressure of steam and at a temperature of about 130 degrees C. Then, after being dried, it is ready for use. The impregnating liquid is a solution of the sulphates of copper and iron, whose preservative properties are generally acknowledged, together with some aluminium, potassium, and magnesium salts. The inventor of the process maintains that the copper destroys any germs

of decay that may be present, while the iron combines with the cellulose, or woody fiber, to form a compound which is insoluble in water and hence cannot be washed out by the action of rain. The salts in this way are made to permeate the substance of the wood, and are not merely deposited mechanically as minute crystals in the pores by the evaporation of the solvent. It is claimed for the process, which, apart from the drying, takes about four hours, that it greatly reduces the inflammability of the wood, enables it to take a brilliant polish, and increases the hardness of certain soft woods to such an extent as to render them available for purposes to which formerly they could not be applied. Another advantage attributed to it is that it saves the expense of seasoning in the ordinary way, since perfectly green wood after treatment neither shrinks nor warps. The process appears already to have gained considerable recognition abroad; thus it is stated that the Bavarian State railways and post-office have contracted to have all their sleepers and poles up to 1905 treated by it, while the Swedish Government has adopted the system and ordered 600,000 sleepers preserved by its use.

FIGURES have been issued in regard to immigration at the port of New York for the year ending June 30th, from which it appears that 341,711 emigrants passed through the port during the year. This is an increase of nearly 100,000 over last year. The following table shows the arrivals of some of the races:

Race.	1898-'99.	1899-1900.
Bohemian and Moravian .....	1,935	2,329
Croatian and Slavonian .....	6,837	8,906
English .....	4,258	4,346
Finnish .....	3,349	6,783
French.....	2,013	1,956
German .....	21,219	23,382
Greek .....	2,351	3,734
Hebrew .....	27,086	44,520
Irish .....	21,637	25,200
Italian (northern).....	13,008	16,690
Italian (southern).....	63,481	82,329
Lithuanian .....	6,033	9,170
Magyar.....	4,517	11,351
Polish.....	26,015	36,855
Ruthenian.....	1,371	2,653
Scandinavian .....	16,034	22,847
Slovak ...	13,550	25,392

THE Sydney correspondent of the *British Medical Journal* describes the various means which have been taken to prevent the spread of the plague in that city. As soon as a case is notified to the Board of Health a medical officer is despatched, and if he confirms the diagnosis the patient is at once removed to the quarantine hospital as well as all the other residents in the house. The house is then thoroughly disinfected under the supervision of the Board of Health officials. The contacts are kept in quarantine for five days, and if no suspicious cases occur among them they are then allowed to return to their home. Large areas of the city have been quarantined in succession, all the residents are kept inside the barriers and not allowed to go to their business. Each house is then cleaned and disinfected; all sanitary fittings and drains attended to, and all rubbish removed and burnt. This process has now been gone through in a large part of the city, so that it is probably cleaner than it has been for a very long time. There has also been an organized crusade against rats, and a capitation grant of 6d. is now made for all rats brought to the incinerator. This has resulted in a very large number of these animals being destroyed. The Government has decided to resume a large part of the wharfage in Darling Harbor and practically rebuild it with stone facings. Citizens' Vigilance Committees have also been organized in the various electoral districts of the city and suburbs, with the object of assisting the Board of Health and the local municipal councils in cleaning and disinfecting. Hitherto in every case all the contacts have been removed to quarantine ground, but it is now recognized that this is not necessary in every case, and at a special meeting of the New South Wales Branch of the British Medical Association it was resolved to appoint a deputation to wait upon the Premier to point out that in the opinion of the members of the Branch the indiscriminate quarantining of contacts is unnecessary.

A GREAT deal of important scientific investigation says the *London Times* is being carried on at different marine biological stations around the coast. Admirable work has been done at the Marine Biological Laboratory at



Plymouth, and it is much to be regretted that more liberal funds cannot be provided to allow the Association to carry on its investigations on a more extended scale. The purpose of that Association was stated by the late Professor Huxley to be that of "establishing and maintaining laboratories on the coasts of the United Kingdom where accurate researches may be carried on leading to the improvement of zoological and botanical science and to an increase of our knowledge as regards the food, life conditions, and habits of British food-fishes and molluscs." At the request of the Devon Sea Fisheries Committee, Mr. W. Garstang, of the Plymouth Association, some time since prepared a report on the efficacy of the methods heretofore adopted in sea fishery hatcheries, together with an account of recent experimental work bearing upon the rearing of the fry of sea fishes, and of the bearings of experiments upon practical proposals for artificially increasing the stock of fish on depleted fishing grounds. In the report in question Mr. Garstang expresses the opinion that in no case has the utility of any past operations in sea fish hatching been satisfactorily demonstrated. He contends that the methods heretofore adopted and the scale upon which they have been carried out have been altogether inadequate for the production of the results which in all cases have been aimed at, and which in several cases have been claimed to have been attained. He believes that no useful results can be expected to accrue from sea fish hatcheries until the problem of feeding and rearing the fry to a more advanced stage has been satisfactorily solved. While he considers that there is a fair prospect of an early solution of this difficulty, he advises that in the meantime, the most useful measure to adopt would be to promote the artificial propagation of sea fishes on board the fishing boats during the spawning season, fertilized eggs to be returned at once to the sea. Mr. Garstang alludes to the sea fish hatcheries which claim to have conducted their operations on more than an experimental scale. These include the cod fish hatcheries in Norway, the United States Fish Commission's hatcheries at Woods Holl and Gloucester, and the Newfoundland Government hatchery at Dildo Island. In regard to

the latter he says: "The inconsistency of the claims made for the work of this hatchery have been exposed by Mr. Fryer in several recent reports of the inspectors of fisheries, so that, beyond expressing my conviction of the fairness and accuracy of his criticisms, I need not dwell upon the merits of this case."

---

#### UNIVERSITY AND EDUCATIONAL NEWS.

SIR JAMES CHANCE has given £50,000 to the endowment fund of the University of Birmingham, which now amounts to about \$2,000,000.

THE residuary estate of the late James Garland is left to Harvard University in the event of no grandchildren surviving. The contingency is perhaps rather remote, but the amount of money involved is said to be several million dollars.

It appears that one of the nephews of the late Jonas Clark is taking steps to dispute the will leaving money to Clark University, but an appeal has not yet been made to the court.

THE new building for the first chemical laboratory of the University of Berlin was dedicated on July 14th. Professor Emil Fischer, director of the laboratory, made an address after which the new building was thrown open for inspection. There were present the minister of instruction, the rector of the University, the permanent secretary of the Academy of Sciences and a number of delegates from foreign universities.

DR. CHARLES A. KOFOID, assistant professor of zoology in the University of Illinois and superintendent of the Natural History Survey of that State, has been appointed assistant professor of histology and embryology in the University of California to begin work January 1, 1901.

MR. R. S. CLAY, late lecturer in physics at the Birkbeck Institution, has been appointed principal of the Wandsworth Technical Institute, London.

DR. EDWIN KLEBS has resigned the professorship of pathology in the Rush Medical College of the University of Chicago.